Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

# State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340



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TO: Wayne Hedberg, Minerals Program Supervisor

FROM: Holland Shepherd, Reclamation Specialist HWS

RE: Review of Revised NOI, Goldstrike Project, M/053/005, Washington County, Utah

I have reviewed the 10/5/90 Tenneco Plan Submittal, for the Goldstrike site. In general, the plan is very thorough and well organized. However, specific sections will require alteration or further explanation before the plan, as a whole, can be approved. My particular concerns deal with final design of slopes associated with the leach pads, waste dumps and pit highwalls. Achieving proper slope angle on these portions of the site will be critical in achieving acceptable reclamation.

The following comments address those areas of the operators plan where questions still exist or changes need to be made:

R613-004-106(5) - Operation Plan - Topsoil Salvage

On page 30 of the plan, the operator states that 193,040 cubic yards of topsoil will be available for reclamation at the end of the mine life. This amount of topsoil will be enough to cover an area 120 acres in size to a depth of 12 inches, or an area 240 acres in size, to a depth of 6 inches. Topsoiling certain areas of the site, like the leach dumps and waste area, with only 6 inches of material, may not result in an adequate vegetation cover. The Division recommends that the operator apply a minimum of 12 inches of topsoil, evenly distributed, over the tops of these areas. On other areas, a minimum of 6-8 inches will be acceptable.

Of the 250 acres of proposed disturbance, 107 acres encompass leach pads and waste dumps approved in the original plan, these areas were approved for a topsoil depth of 8 inches; 29 acres encompass proposed dump areas, these areas will require a minimum depth of 12 inches of topsoil; 30 acres encompass pit areas (not to be reclaimed) and 84 acres encompass road and site facilities requiring a minimum of 6 inches. The operator will need 129,470 $yd^3$ of topsoil to reclaim the, already approved,

heap leach and dump areas to a depth of 8 inches, and 46,777 $yd^3$ of topsoil to reclaim the proposed dump area to a depth of 12 inches. The remaining acreage can be reclaimed with 67,760 $yd^3$ of topsoil to a depth of 6 inches. A total of 244,007 $yd^3$ of topsoil or substitute topsoil material, will be required to meet ultimate reclamation performance standards. This will amount to a deficit of 50,967 $yd^3$ of topsoil.

This deficit could be removed by utililizing one of the following:

1. Salvaging topsoil on site, to greater depth;

2. obtaining substitute topsoil material found off site;

3. performing soil tests, which would indicate that overburden material to be used as part of soil planting medium is of equal soil value as existing soils found in the areas to be disturbed.

R613-004-106(3) - Operation Plan - Erosion Control Techniques

Presently, the south side of the haul road, heap leach pad #2 and the southeast side of the Hamburg Peak encroach on Quail Creek. The operator has installed 2 silt fences in the diversion ditch which directs drainage from Quail Creek into Arsenic Creek. These structures may be inadequate to treat sediment during major ppt events. The operator should be asked to re-evaluate the design of these structures, especially in light of the pending major pad and drain construction planned for Quail Creek. Any structures to be placed in this drainage should meet design standards for the 10-year, 24-hour storm. This may require another sediment pond or a series of silt fences or gabion dams placed strategically in the channel, down stream from the sources of disturbance. The drainage basin associated with this area (D) will encompass 34 acres and will provide 35 cfs at peak flow during the 10-year, 24-hour event storm (discussed on page 43 of the plan). Currently the drainage area associated with Quail Creek is 610 acres and will run at 400 cfs during the 10-year, 24-hour event storm. After construction, of the Quail Creek dam, the amount of potential runoff will be reduced by several magnitudes.

R613-004-110(6) - Reclamation Plan - Slopes

The operator indicated on page 50 of the plan, that leach pad slopes and waste rock slopes will be left at 2:1. The Division will require that all slopes to be reclaimed at 3:1. Any slopes reclaimed at steeper angles will require that alternate

slope cover stabilization techniques be implemented for the purpose of establishing an effective plant cover.

Waste rock area slopes to be left at 1.8:1 slopes will not be acceptable, unless the operator is willing to apply slope stabilization techniques that will allow plants to achieve the same cove as those on adjacent areas. Such techniques might include cross-slope furrowing or terracing, benching, netting, brush wattling, shrub or tree seedling installation.

At final reclamation the Division recommends that the operator push, neutralized leached material off the liners, if necessary, to obtain final grades of 3:1 on dump slopes. The material must first meet the neutralization standards required by the Sate Health Department.

R613-004-111(10) - Reclamation Practices - Pits/Highwalls

On page 50 of the operator's Plan, pit highwalls are described as having a final configuration of 50 to 56 degrees. The Division will not allow pit highwalls to have a final slope of anything greater than 45°. Also, we will require the reclamation of benches, using the same methods to be used for other portions of the site. The operator will also be required to plant nursery stock shrubs and trees on the pit wall benches. No variances will be given on the pit walls for vegetation and slopes except for the face walls between benches. The operator must incorporate , into the plan, designs for the partial reclamation of pit slopes.

The pit bottoms must remain accessible to wildlife. This can be accomplished by designing talus slopes into the final pit design, and using old haul roads as avenues for wildlife access. More than one access route will be required for wildlife. If pit bottoms are to impound water, then the operator must take steps to ensure this water will be of adequate quality for wildlife. The operator must furnish the Division with an analysis of the type of water expected to be found at the bottom of the two pits remaining at the end of mining (the Padre and the Basin pits).

The operator will also be asked to plant riparian vegetation, at the bottoms of pits impounding water. This is necessary to enhance the wildlife habitat components of cover and shelter.

R613-004-111 - Reclamation Practices - General

Much of the Tenneco Plan was approved in 1988. The Division granted variances for certain areas of the earlier plan, which addressed highwalls and dump slopes. Those areas which remain unaltered by the current proposal will require no change from the original proposal; however, new areas and areas altered by the existing proposal will require compliance with the new highwall and slope requirements. Areas, for which a variance still applies, include the Hamburg Pit, and portions of the Main and Padre pits. The waste dumps slopes to be established northeast of the Padre Pit will require the application of alternate surface stabilization techniques if slopes are to be left at greater than 3:1.

R613-004-110(13) - Reclamation Plan - Revegetation

The Division will allow impounding structures to remain on site, providing adequate reclamation is performed on them. Plant species adaptable to riparian areas should be installed on and in this remaining impounding areas. Riparian shrubs should be planted in areas where water availability will be most prevalent, at the bottom of impoundments. Grasses and forbs should be planted on the tops and side slopes of these areas to help in stabilization. Woody species should be avoided on the impounding structure itself.

R613-004-118&119 - REVISIONS AND AMENDMENTS

I recommend that this plan amendment be reviewed as a revision, based on the high significance of further impacts, to the site, described in the proposal. The operator proposes to impact another 40 acres of predominantly public land. The impacts are not insignificant. The proposal calls for major impacts to Quail Creek and the creation of several areas that will not be reclaimed, such as pits and highwalls.

jb
MNM053005.3